AMENDMENTS TO THE DRAWINGS

The attached drawing sheet includes changes to Fig. 6. This sheet, which includes Figs. 6-8, replaces the original sheet including Figs. 6-8. Changes incorporated in the sheet are highlighted on the attached annotated sheet.

Attachment: Replacement Sheet

Annotated Sheet Showing Change

REMARKS

The disclosure stands objected to for a number of informalities. Based on some of the objections, it appears that the amendments to the specification submitted with the Preliminary Amendment filed with the application on July 23, 2004 were not entered. Accordingly, to facilitate response to the objections to the disclosure in the present Office Action, Applicants request withdrawal of the amendments to the specification included in the Preliminary Amendment filed July 23, 2004. Due to the large number of amendments necessitated by the Examiner's objections, Applicants purpose replacing the present specification with the attached substitute specification. Pursuant to 37 C.F.R. § 1.125, clean and marked-up copies of the substitute specification are attached hereto.

Regarding the objection to paragraph [0026], the first two lines of this paragraph have been amended for clarity. Support for this amendment is found in paragraph [0051] as originally filed.

Regarding the objection to paragraphs [0057] and [0058], the terms in each of the equations appearing in these paragraphs have been explicitly defined in the substitute specification. Support for the meaning of each term can be found in the specification as originally filed or in the general knowledge of those skilled in the art of electromagnetics (see, for example, the attached Exhibit 1 excerpt from Electromagnetics, Second Edition, copyright 1973, by Kraus and Carver). It is believed that the substitute specification includes no new matter.

Fig. 1 stands objected to for failing to include reference numbers 81 and 82. It is respectfully pointed out that reference numbers 81 and 82 are included on the right-hand side of Fig. 1B as originally filed.

Fig. 6 stands objected to for "6f" not being labeled -- 66f --. In addition, Applicants have noted that reference number "6g" should be labeled -- 66g --. Applicants propose amending these reference numbers as shown in highlight on the attached annotated sheet.

Claims 21-40 stand rejected under 35 U.S.C. § 112, second paragraph, for indefiniteness. It is believed that the foregoing amendments to the claims overcome this rejection.

Claims 21, 22, 31, 32 and 36 stand rejected under 35 U.S.C. § 102(e) for anticipation by U.S. Patent No. 6,441,700 to Xu. Claims 23-30, 33-35 and 37-40 have not been rejected on the merits.

Independent claims 21 and 37 have been amended to recite that the displaceable dielectric is common to both said two phase shifters for the purpose of altering the electrical length of the microstrip lines of the two phase shifters in the same direction, i.e., both increase or decrease synchronously. In contrast, the Xu patent teaches a phase shifter arrangement (Fig. 1), wherein a moveable planar dielectric element (C) having a series of teeth (4, 5) along opposite edges, is slidably mounted and adjacent to the top surface of distribution element (A) with two parallel conductive tracks (3). The moveable dielectric element (C) is supported in a linear slidable manner by two parallel rods (6, 7) attached to the ground plane (B). By selectively moving the dielectric element, the phases in the top and bottom sections of the antenna array are changed in opposite directions so that the phase in one section is increased and the phase in the other section is decreased, which causes the radiating beam to tilt.

As can be seen, the Xu patent does not disclose a displaceable dielectric that causes a change in the electrical length in both phase shifters in the same direction.

Absent disclosing, teaching or suggesting a phase shifter arrangement or an antenna array having all the limitations of independent claims 21 and 37, respectively, the Xu patent cannot anticipate or render obvious these claims, or claims 22-36 and 38-40 dependent therefrom.

CONCLUSION

Based on the foregoing amendments and remarks, reconsideration of the objections and rejections and allowance of claims 21-40 are requested.

Respectfully submitted,

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Annotated Sheet Showing Change

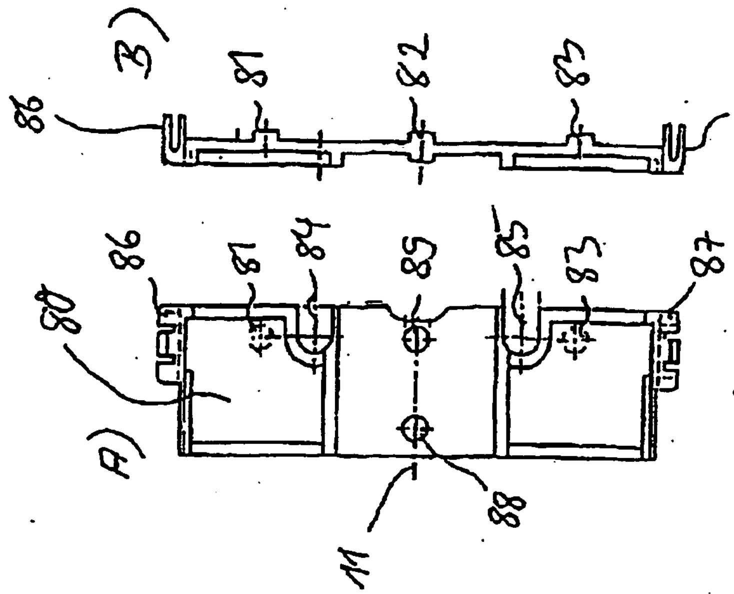

FIG. 8

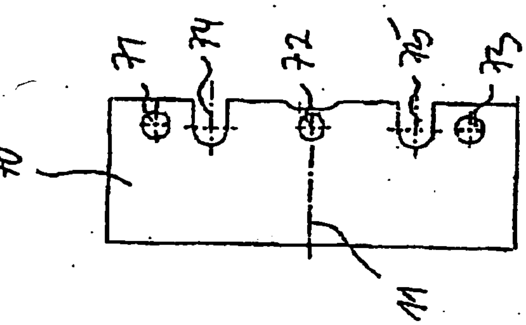

FIG. 7

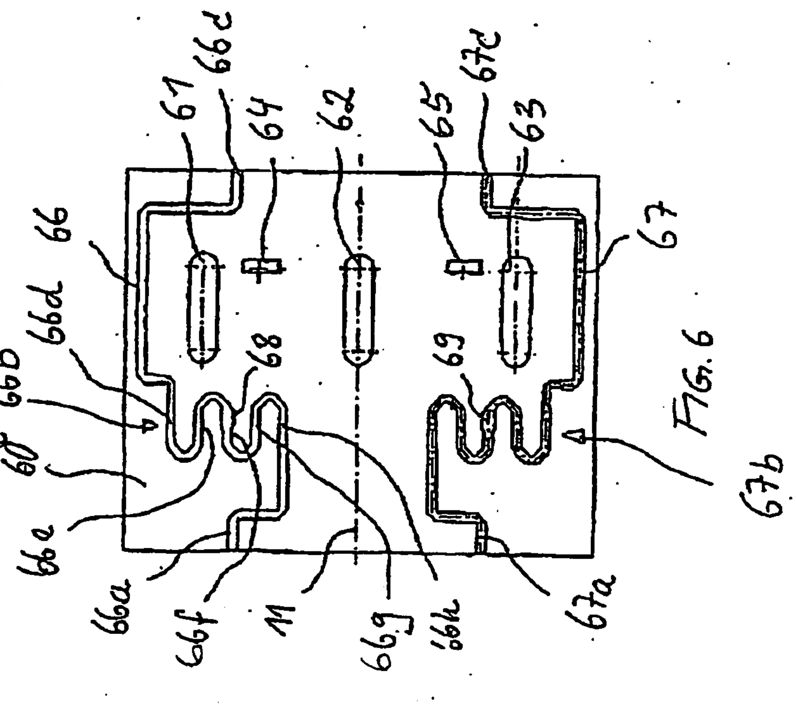

FIG. 6

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ELECTROMAGNETICS

SECOND EDITION

This book was set in Times New Roman.
The editors were Charles R. Wade and Madelaine Eichberg;
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OTHER McGRAW-HILL BOOK COMPANY BOOKS BY JOHN D. KRAUS

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11 12 13 14 15 16 KPKP 83210

SYMBOLS, PREFIXES, AND ABBREVIATIONS

See Appendixes A–1 (Units) and A–2 (constants and conversions) for more detailed information

A	ampere
Å	angstrom $= 10^{-10}$
A	vector potential, Wb m^{-1}
A, *a*	area, m^2
AR	axial ratio
AU	astronomical unit
a	atto $= 10^{-18}$
â	unit vector
B, *B*	magnetic flux density, T $=$ Wb m^{-2}
B	susceptance, ℧
B	susceptance/unit length, ℧ m^{-1}
BWFN	beam width, first nulls
C	coulomb
C	capacitance, *F*
C	capacitance/unit length, F m^{-1}
C, *c*	a constant, c = velocity of light
cc	cubic centimeter
°*C*	degree Celcius
D, *D*	electric flux density, C m^{-2}
d	distance, m
deg	degree, angle
dB	decibel $= 10 \log(P_2/P_1)$
dBi	decibels over isotropic
dl	element of length (scalar), m
*d***l**	element of length (vector), m
ds	element of surface (scalar), m^2
*d***s**	element of surface (vector), m^2
dv	element of volume (scalar), m^3
E, *E*	electric field intensity, V m^{-1}
emf	electromotive force, V
e	electric charge, C
F	farad
F, *F*	force, N
f	femto $= 10^{-15}$
f	force per volume, N m^{-3}
f	frequency, Hz
fu	flux unit
G	giga $= 10^9$
G	conductance, ℧
G	conductance/unit length, ℧ m^{-1}
g	gram
H	henry
H, *H*	magnetic field, A m^{-1}
HPBW	half-power beam width
Hz	hertz $=$ 1 cycle per second
I, *I*, *i*	current, A
J	joule
J, *J*	current density, A m^{-2}
K	kelvin
K, *K*	sheet-current density, A m^{-1}
K, *k*	a constant
k	kilo $= 10^3$
kg	kilogram
L	inductance, H
L	inductance/unit length, H m^{-1}
l, *L*	length (scalar), m
l	length (vector), m
LCP	left circularly polarized
LEP	left elliptically polarized
ln	natural logarithm (base *e*)
log	common logarithm (base 10)
M	mega $= 10^6$
M, *M*	magnetization, A m^{-1}
M	polarization state $= M(\epsilon, \tau)$
m, *m*	magnetic (dipole) moment, A m^2
m	meter
m	milli $= 10^{-3}$
min	minute
N	newton
N, *n*	number (integer)
Np	neper
n	nano $= 10^{-9}$
n̂	unit vector normal to a surface
P, *P*	polarization of dielectric, C m^{-2}
p	electric dipole moment, C m^{-3}
P	polarization state $= P(\gamma, \delta)$
P	power, W
P	power per solid angle, W rad^{-2}
P_n	power pattern, dimensionless
$\mathscr{P}$	permeance, H
$\mathscr{P}$	radiation pressure, N m^{-2}
p	pico $= 10^{-12}$
Q, *q*	charge, C
R	resistance, Ω
R	resistance/unit length, Ω m^{-1}
$\mathscr{R}$	reluctance, H^{-1}
RCP	right circular polarization
REP	right elliptical polarization
r	revolution
r	radius, m; also coordinate direction
r̂	unit vector in *r* direction
rad	radian
rad^2	square radian $=$ steradian $=$ sr
S, *S*	Poynting vector, W m^{-2}
S	resistivity, Ω m
S, *s*	distance, m; also surface area, m^2
s	second (of time)
sr	steradian $=$ square radian $=$ rad^2

T	tesla = Wb m^{-2}
T	tera = 10^{12}
T	torque, N m
t	time, s
U	magnetostatic potential, A
V	volt
V	voltage (also emf), V
$\mho$	emf (electromotive force), V
v	velocity, m s^{-1}
W	watt
W	energy, J
Wb	weber = 10^4 gauss
w	energy density, J m^{-3}
X	reactance, Ω
X	reactance/unit length, Ω m^{-1}
$\hat{\mathbf{x}}$	unit vector in x direction
x	coordinate direction
Y	admittance, ℧
Y	admittance/unit length, ℧ m^{-1}
$\hat{\mathbf{y}}$	unit vector in y direction
y	coordinate direction
Z	impedance, Ω
Z	impedance/unit length, Ω m^{-1}
Z_c	intrinsic impedance, conductor, Ω per square
Z_d	intrinsic impedance, dielectric, Ω per square
Z_L	load impedance, Ω
Z_{yz}	transverse impedance, rectangular waveguide, Ω
$Z_{r\phi}$	transverse impedance, cylindrical waveguide, Ω
Z_0	intrinsic impedance, space, Ω per square
Z_0	characteristic impedance, transmission line, Ω
$\hat{\mathbf{z}}$	unit vector in z direction
z	coordinate direction, also red shift
α	(alpha) angle (deg or rad)
β	(beta) angle, deg or rad; also phase constant = $2\pi/\lambda$
γ	(gamma) angle, deg or rad
δ	(delta) angle, deg or rad
ϵ	(epsilon) permittivity, F m^{-1}
ϵ_0	permittivity of vacuum, F m^{-1}
$\bar{\varepsilon}$	(epsilon) tensor permittivity, F m^{-1}
η	(eta) index of refraction
θ	(theta) angle, deg or rad
$\hat{\boldsymbol{\theta}}$	(theta) unit vector in θ direction
κ	(kappa)
Λ	(capital lambda) flux linkage, Wb turn
λ	(lambda) wavelength, m
μ	(mu) permeability, H m^{-1}
μ_0	permeability of vacuum, H m^{-1}
μ	(mu) mobility, m^2 s^{-1} V^{-1}
μ	(mu) micro = 10^{-6}
ν	(nu)
ξ	(xi)
π	(pi) = 3.14
ρ	(rho) electric charge density, C m^{-3}; also mass density, kg m^{-3}
ρ	reflection coefficient, dimensionless
ρ_s	surface charge density, C m^{-2}
ρ_L	linear charge density, C m^{-1}
σ	(sigma) conductivity, ℧ m^{-1}
τ	(tau) tilt angle, polarization ellipse, deg or rad
τ	transmission coefficient, deg or rad
ϕ	(phi) angle, deg or rad
$\hat{\boldsymbol{\phi}}$	(phi) unit vector in ϕ direction
χ	(chi) susceptibility, dimensionless
ψ	(psi) angle, deg or rad
ψ_m	magnetic flux, Wb
Ω	(capital omega) ohm
Ω	(capital omega) solid angle, sr or deg^2
℧	(upsidedown capital omega) mho (℧ = 1/Ω = S, siemens)
ω	(omega) angular frequency ($= 2\pi f$), rad s^{-1}